PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

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PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43*bis*.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/GB2004/004390	15.10.2004	15.10.2003

International Patent Classification (IPC) or both national classification and IPC
B01J19/00, H01L51/30

Applicant
OXFORD GENE TECHNOLOGY IP LIMITED

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☒ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notifed the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/GB2004/004390

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

   ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

   a. type of material:

   ☐ a sequence listing

   ☐ table(s) related to the sequence listing

   b. format of material:

   ☐ in written format

   ☐ in computer readable form

   c. time of filing/furnishing:

   ☐ contained in the international application as filed.

   ☐ filed together with the international application in computer readable form.

   ☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application,

☒ claims Nos. 13-30, 31-38 (in part)

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination *(specify)*:

☒ the description, claims or drawings *(indicate particular elements below)* or said claims Nos. 13-30, 31-38 (in part) are so unclear that no meaningful opinion could be formed *(specify)*:

see separate sheet

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for the whole application or for said claims Nos.

☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:

the written form ☐ has not been furnished

☐ does not comply with the standard

the computer readable form ☐ has not been furnished

☐ does not comply with the standard

☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-*bis* of the Administrative Instructions.

☐ See separate sheet for further details

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-12,31-41
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-12,31-41
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-12,31-41
	No:	Claims	

2. Citations and explanations

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Reference is made to the following documents:

D1: WO 03/020415 A2 (ISIS INNOVATION LIMITED; SOUTHERN, EDWIN, MELLOR; EGELAND, RYAN, D) 13 March 2003 (2003-03-13)

D2: US-B1-6 630 359 (CAILLAT PATRICE ET AL) 7 October 2003 (2003-10-07)

D3: US-A-6 093 302 (MONTGOMERY ET AL) 25 July 2000 (2000-07-25)

D4: WO 01/43870 A (MOTOROLA INC; SHI, SONG; ZHANG, PEIMING; MARACAS, GEORGE; MARACAS, GEO) 21 June 2001 (2001-06-21)

D5: WO 98/01758 A (NANOGEN, INC) 15 January 1998 (1998-01-15)

Re Item III

Independent claim 13 lacks clarity (Article 6 PCT). It defines a device in part by the (transient) medium that is used in it, namely the electrolyte (which in turn is defined by its desired properties).

It is clear from page 16, lines 29-31 of the application that there may be a cycling of reactant and electrolyte. This would result in the device being periodically as claimed and not as claimed when being flushed. Thus the scope of protection for the device would be effectively determined by how it is being used, rather than by reliably determinable technical apparatus features, thus rendering it unclear.

Since the above feature seems to be an essential part of the inventive concept, since the device without this feature seems to lack novelty, see D2 and D4 with passages cited in the Search Report (and from the description of the application it would also appear that this arrangement of electrodes is already known from LCD screens etc.) and since its removal may add subject-matter, a meaningful assessment of novelty, inventive step and unity of invention is at present not possible.

As a result, also claims 14-41, insofar referring to claim 13, are also unclear and cannot be examined either.

Re Item V

1. Document D1 discloses a method and a device for electrochemically treating a substrate with electrodes producing first and second quenchable redox products. The

electrodes are individually addressable (see step (b) in claim 20) and there can be one common counter electrode (see claim 25). The subject-matter of claim 1 differs from D1 in having a common first electrode arranged to define cells therein.

Document D3 discloses a method and a device for electrochemically treating a substrate with addressable electrodes and "getter" electrodes arranged to define cells around the addressable electrodes (see for example Figure 36). The electrolyte (usually water) is such that the second redox product (H^+) is quenchable by the first redox product (OH^-). The "getter" electrode may be used in conjunction with a scavenging solution and has the function of scavenging electrochemically generated reagents that may diffuse away from the electrode. The subject-matter of claim 1 differs from D3 in that the substrate appears to be separated from the device (the device faces the substrate), the first electrode is "common", and that the getter electrodes appears to be not necessarily the counter electrodes.

The subject-matter of claim 1 is therefore novel (Article 33(2) PCT).

Document D1 is at present considered to be the closest prior art.

The difference with D1 seems to be twofold: the electrode is "common" and it defines cells. This seems to lead to a simple arrangement allowing modification of a substrate with improved resolution.

Document D2 (see passages cited in the Search Report) describes a system and method for electrochemically treating a substrate. It has an arrangement of a common first electrode ((9b) or (29) in Figures 1 and 2) arranged to define cells therein and individually addressable second electrodes. In column 1, lines 26-38, it becomes clear that this document is concerned with the demand for systems enabling the chemical or biological analysis with a very large number of points (i.e., high resolution). D2, however changes the surface of the addressable electrodes itself and not of a substrate above it. Assuming that the method of claim 1 is effected in a flow cell (i.e., there is a space between the first electrode and the substrate through which liquid can flow) it is not obvious from D2 that this solution would also be suitable for treating a separate surface not in contact with the first and second electrodes.

The subject-matter of claim 1 then also appear to involve an inventive step (Article 33(3) PCT).

Claims 2-12 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

Although the category and dependency of claims 31-38 is unclear, they would also be novel and inventive if they would properly depend on claim 1.

Independent claims 39 and 41, as well as dependent claim 40, appear to be novel and inventive for the same reasons as mentioned for claim 1.

Re item VIII

Claims 31-41 do not comply with the requirements of Article 6 PCT.

For claims 31-38 both the category and the dependency, and even if they are to be considered as independent or dependent, are not well defined.

The combination of independent claims 1, 39 and 41 leads to a multiplicity of independent claims in the same category. Although these claims have been drafted as separate independent claims, they appear to relate effectively to the same subject-matter and to differ from each other only with regard to the definition of the subject-matter for which protection is sought and/or in respect of the terminology used for the features of that subject-matter. The aforementioned claims therefore lack conciseness and as such do not meet the requirements of Article 6 PCT.